

The Effect of Excises on the Taxation and Measurement of Income

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Excise taxes have been a declining part of the Federal tax structure for many years. In the last few decades the levying of excise has increasingly been left to State and local governments.

Recent developments have reversed the declining interest in excises at the Federal level. Current energy tax proposals would substantially increase U.S. Treasury revenues from excises. As a concurrent development, concern with tax reform has led to a reconsideration of whether State and local excise taxes should continue to be allowed as deductions on individual Federal income tax returns.

This paper considers three controversial questions that take on importance when excises are placed in an economy that both measures and taxes income. First, if Federal excises are increased, will income tax collections be affected? Any significant effect needs to be taken into account in revenue estimation and macroeconomic policy decisions. Specifically, will the levying of a Federal excise tax reduce Treasury income tax revenues, and, if so, by how much?

A second question concerns the measurement of national income. Since excise taxes are subtracted from national product when determining national income, it is possible that switches in

GEORGE S. TOLLEY is with the Department of Economics at the University of Chicago, and C. EUGENE STEUERLE is with the Department of the Treasury.

the form of taxation—for instance, raising more revenue from excise taxes and less from income taxes—will arbitrarily affect measured national income. More generally, there is the possibility that a change in excises could change measured national income even though there was no real change in employment or output of the economy. The question becomes: Will a change in excises lead to totally arbitrary changes in the measurement of national income, and, if so, what remedy is called for?

A third perennial question is how to treat State and local excises for purposes of Federal taxation. Involved here is the broad issue of how to mesh tax systems at different government levels. Do principles of neutrality and horizontal equity suggest criteria for deductibility of State and local taxes, and what do the criteria indicate about the treatment of excises?

A key idea governing the answers given in this paper to these three questions is that an excise tax, in contrast with a personal income tax, is a cost of doing business. It is recognized as such by business firms and by Federal, State, and local taxing authorities in the calculation of business income and the paying out to recipients of income left after expenses. Because the analysis in each case is governed by this key idea, the answers given in this paper to the three questions are at once definite and surprisingly simple.

Effect of Excise Taxes on Income Tax Collections

When a new excise of \$10 is levied, the \$10 is paid to the government, and \$10 less income is left in the private sector. The \$10 will be subtracted as a business expense, and there will be \$10 less available to pay out as wages, salaries, interest, and dividends or to keep as retained earnings. Since the tax reduces the amount of payments to factors of production, it reduces the amount of their income that can be subject to tax. Hence, the first of the three questions can be answered: *An increase in excise taxes will reduce real income tax collections.*

Real and Nominal Changes

Even though the logic leading to the proposition is simple, it has been argued that the burden of an excise may be passed forward to consumers with no change in factor payments and, hence, no change in income tax collections. The most straightforward version of this line of thinking is that factor prices are rigid down-

ward, and that the excises must therefore be passed along as cost increases and result in a general increase in product prices. If this is the case, factor payments and, hence, income subject to tax will not change—with the result that the introduction of the excise leaves income tax payments unaffected.

The argument in this form disguises the issue of the measurement of real vs. nominal changes in income. In real income terms, the original proposition remains valid. If rigidities do prevent money incomes from falling, then product prices must rise, and the purchasing power of income—as measured by money payments divided by power prices—must fall. That is, the purchasing power of an hour of labor or capital services will decrease because of the excise, regardless of the ultimate inflationary effect of the excise. Similarly, even if income tax payments are unaffected in money terms, real income tax payments will fall.

A question remains as to whether the amount of the fall in real income tax payments is affected by a possible inflationary impact of excises. If income tax liabilities were perfectly indexed, any inflationary impact would be reflected in an equal proportionate change in money tax payments. That is, tax collections would equal a constant proportion both of income subject to tax and of factor payments. Since the real value of these factor payments would fall by the amount of the excise tax, the fall in real income tax payments would be the same no matter what the general price level effects. In the present, nonindexed, progressive income tax system, however, any inflationary impact changes money tax payments and factor incomes at different rates. In the extreme case, one in which there is no fall in money incomes, the entire reduction in real values of the income tax comes from price rises. This contrasts with the case in which there is no price change and the entire fall in real income tax collections is the result of reduced money tax liability.

Let nominal income tax collections T depend on factor incomes F :

$$T = T(F), \quad (1)$$

where progressivity implies that the marginal tax rate $T'(F)$ is greater than the average rate T/F . The value of final output Y differs from factor incomes by the value of excise collections V ; i.e.,

$$F = Y - V. \quad (2)$$

With an ad valorem excise tax rate v on sales of final output, excise collections are v percent of the value of final output, or

$$V = vY. \quad (3)$$

Combining equations (2) and (3) implies that $F = (1-v)Y$ or that the output/factor ratio, $\frac{Y}{F}$, equals $1/(1-v)$. The value of final output can in turn be expressed as a price level index P times real output y :

$$Y = Py. \quad (4)$$

Factor income then equals the percent of final output remaining after excises times the price level for final output times real output: $F = (1-v)Py$. Substituting this result into equation (1) gives for tax collections:

$$T = T[(1-v)Py]. \quad (5)$$

To find the effects of an increase in the excise tax rate v on income tax collections T , take the differential of equation (5) and divide the result by equation (5) to obtain changes in percentage terms. Using the substitution $F = (1-v)Py$ then gives:

$$dT/T = [T'/(T/F)] [(dP/P) - dv/(1-v)]. \quad (6)$$

Equation (6) says that the percentage change in nominal income tax collections equals the elasticity of revenues with respect to nominal income $T'/(T/F)$ multiplied by the difference between the percentage change in prices, dP/P , less the change in the excise tax rate, dv , times the value of output remaining after payment of excises, $1/(1-v)$.

To find the effect on tax collection requires knowledge of the price level change, dP/P . It is not clear that prices will change in response to an increase in excises; i.e., dP/P may be zero. On the other hand, if factor prices are determined exogenously, excises would be passed forward entirely by inflationary price increases, and every one percent rise in excises as a fraction of value remaining after excises would result in a one percent rise in the price level.¹ To consider alternative cases, the parameter h may

¹ Let n be the number of factor units in the economy, and let the money payment per unit of factor be W , which implies factor payments are $F = Wn$. Let c be the output produced by each factor unit, so that real output is given by $y = cn$. Using equation (4), the amount remaining for factor payments after excise tax collections is $F = (1-v)Pcn$. Equating the expressions for F in the two preceding expressions and rearranging as an expression for the deflated or real value of factor payment per unit gives

$$W/P = c(1-v).$$

be introduced:

$$dP/P = h \, dv / (1-v), \quad (7)$$

where h is the percentage rise in prices resulting from a one per cent rise in excises as a fraction of value remaining after excises. The value of h equals zero if there is no inflation and one if excises are entirely passed through as price increases, while it may take on intermediate values between one and zero.

Substituting the expression for $\frac{dP}{P}$ from equation (7) into equation (6) and rearranging as an expression for the percentage decrease in nominal tax collections resulting from a one per cent increase in the excise rate gives

$$-\frac{dT}{dv} \cdot \frac{(1-v)}{T} = (1-h)\eta, \quad (8)$$

where η is the elasticity of nominal taxes with respect to nominal income $T'(F)/(T/F)$. With no inflation ($h=0$), nominal income tax collections go down by the full value of the elasticity η . With maximum inflationary impact ($h=1$), nominal income tax collections do not change.

Now consider the real value of income tax collections t . Since $t = T/P$, the percentage change in real income tax collections obeys

$$dt/t = dT/T - dP/P. \quad (9)$$

Combining equations (7), (6), and (9) results in the following expression for the percentage decrease in real income tax collections resulting from a one per cent increase in the excise rate:

$$-\frac{dt}{dv} \cdot \frac{1-v}{t} = (1-h)\eta + h. \quad (10)$$

The decrease in real income tax collections is an average of the noninflationary elasticity of income tax collections, η , weighted by the excise fraction, $1-h$, not passed on in inflationary price increase *plus* the inflationary elasticity of unity times the fraction h that is passed on in inflationary price increases. The inflationary elasticity, implied by coefficient of h , is unity because with no

Taking percentage changes:

$$dW/W - dP/P = -dv/(1-v).$$

This result shows that if there is no inflation ($dP/P=0$), factor payments per unit will fall by the same percentage as the rise in excises as a fraction of value remaining after excises. If factor payments are completely rigid downward ($dW/W=0$), the price level will rise by the same percentage as the rise in excises as a fraction of value remaining after payment of excises. These cases represent bounds to the analysis.

change in nominal factor payments and hence no change in income tax collections, real income tax collections will change simply in proportion to the price level.

As a numerical illustration, if the marginal rate of tax on nominal income $T'(F)$ is .25 (which is itself an average of all the individual marginal rates in the economy when total income changes) and if the average rate of taxation T/F is .10, then the elasticity η is 2.5. From equation (8), nominal income tax collections will fall 2.5 percent for each one percent increase in the excise fraction if there is no inflationary impact ($h=0$). Nominal income tax collections will not fall at all if there is complete pass-through ($h=1$); in an intermediate case, collections will fall 1.25 percent if the elasticity of prices with respect to the excise fraction is one-half ($h=.5$).

From equation (10), real income tax collections will fall 2.5 percent if there is no inflationary impact ($h=0$), 1 percent if there is complete pass-through ($h=1$), and 1.75 percent if the elasticity of prices with respect to the excise fraction is one-half ($h=.5$).

Thus, while the proposition that real income tax collections will fall is not in doubt, the magnitude of the decline varies under a nonindexed progressive income tax system. To estimate the magnitude of real tax collections requires knowledge of the extent (if any) to which absolute prices will rise as a result of an excise. It is also clear that the change in nominal income tax collections—if these are of interest—will depend on the extent to which prices rise.

Excises and the Causes of Inflation

Because the change in real income tax collections will be influenced by the extent to which an excise raises the price level, it is necessary to consider the issue: To what extent, if any, does an excise cause inflation? To estimate the impact of a change in excise taxes, an explicit estimate of inflation needs to be made, and it should be carried through the entire analysis, with impacts on the economy presented in real as well as nominal terms.

The following discussion indicates some of the considerations that go beyond traditional tax considerations. Views on the extent of inflation induced by excises vary widely. However, it is often assumed that excises result dollar for dollar in higher product prices and that there is no effect on money payments to factors of production. Analyses of the value-added tax have featured this assumption, as have some analyses of energy tax proposals. The

rationale for this assumption has apparently been the ratchet hypothesis—that money wages can go up but not down. While more recent views retain the idea that wages change less rapidly than prices, these views also stress that wages have greater flexibility over a longer period and that wages do respond to events in the economy. For instance, wages could be set in anticipation of prices so that the expected level of wages divided by prices, or real wages, would reflect expected labor market conditions. Since the economy is made up of many different labor markets, some wages are changed quite frequently while others are not. Some wages will be set through labor negotiations and some through freer competitive adjustments. Some wage payments will respond quickly to a change in demand and supply conditions and others will not. Therefore, in an economy experiencing continuing inflation, a downward shift in labor demand may result not in an absolute decline in money wages, . . . but in less of a rise than would otherwise have occurred.

In such a system of wage determination, consider the introduction of a universal ad valorem excise on all final goods. Given the absence of instantaneous adjustment of wages, cost curves of firms will be raised. A reduction in output will be avoided only if monetary and fiscal authorities somehow offset the possible decrease in aggregate supply.

First, suppose that these authorities are unsuccessful in fully offsetting the decrease. This appears to be the most likely outcome because of the uncertain atmosphere in which monetary and fiscal policy decisions take place and because of lags in effects of these policies. For instance, the introduction of the excise—one of the myriad events of unknown impact affecting the course of the economy at any time—may, by inducing firms to reduce output, lead to a reduction in the demand for money and credit. If the Federal Reserve is maintaining interest rates and credit availability at predetermined levels, a contraction of money and credit will automatically occur in response to the reduced demand. To counter the automatic contraction successfully, the Federal Reserve must actively undertake changes to make credit easier. The information on which to base such a decision may well not be available, and even if it is, an atmosphere of uncertainty may discourage action. If the excise perturbation is minor relative to other changes occurring, the likelihood is increased that there will be no monetary reaction to the excise. If to these considerations is added the uncertainty about the lag in monetary policy, several months may elapse before considerations are effective.

Similarly, on the fiscal side there may be lags and uncertainties in the development of policy. For instance, the agencies of the Government may not be able to bring about an immediate increase in demand through an increase in purchases.

In the likely event, then, that the effect of the excise tax is not fully offset, the excise would likely have an effect in factor markets. Wage contracts just being renegotiated may respond to the more slack conditions by anticipating a somewhat lower real wage. In this manner, a part of the impact of the excise tax may be reflected back in a lower money wage than would otherwise have prevailed—correspondingly reducing inflationary impact on product prices.

On the other hand, even if the Government is successful in fully offsetting the effect of the excise tax, dollar for dollar inflationary impact still may not occur. For example, suppose that the Government returns the excise in the form of reduced direct taxes on factor payments. Then, while real before-tax factor payments would go down because of the excise, real after-tax income would rise because of lower direct taxes. If owners of factors are myopic and price their factors only by nominal before-tax wages and profits, then the inflationary impact is much different than if they price the factors according to the net after-tax payments. In the latter case, if the excise tax is inflationary, then the lower income tax is deflationary. Again, even if there is some immediate or short-run inflexibility in nominal before-tax wage and profit rates, it may be reflected more in shifts in rates of increase of various factor payments than in an increase in the aggregate rate of increase of product prices.

The discussion thus far has concerned a universal excise. For the more usual case of an excise tax applied to only one commodity (e.g., oil or gas) rather than to all commodities, there will be relative price effects as firms producing the commodity encounter higher costs when the excise is introduced. The same considerations suggesting either an imperfect monetary or fiscal response or, in the case of a perfect response, an offsetting deflationary pressure, apply *a fortiori* to a price rise originating in only one part of the economy. Meanwhile, with or without these responses, shifts in output composition and deployment of factors will begin, and these shifts will affect both the price and unemployment impacts of the excise. While output and employment in the taxed industry will grow more slowly than they would have otherwise, the reduction in that industry relative to all other industries may be accomplished in part, and perhaps in whole, by a slowdown in

its rate of increase in the hiring or replacement of labor. The result will then be a greater rise in the price of the taxed commodity and a lesser rise in the price of other commodities than would have occurred in the absence of the excise—with the path of the general level of prices being affected little or possibly not at all by the excise.

Distributional Effects of a Single Commodity Excise

To analyze the distributional effects of an excise, the formulas for estimating real and nominal effects of a universal excise proposed in the first section of this paper are often inadequate. A more general framework is needed to handle the effects of an excise on a single commodity. A single-commodity excise generally leads to a change in the price of the taxed commodity *relative* to all other commodities as well as to reductions in real factor income remaining after collection of the excise tax revenues. As before, the reduction in real factor payments will reduce real income tax collections.

The more general framework is particularly relevant when there is the possibility of designing an additional tax package that will offset the distributional effects of the tax. A naive approach is to calculate the effect of the excise on expenditures of each income group according to the amount of the commodity each currently purchases and to assume that this constitutes the impact on the income group. Column (a) of table 1 demonstrates such an effect for a \$32 billion excise on a single commodity of hypothetical interest.

This first column gives only the loss to each income group from the rise in price of the taxed commodity. This increase in relative price of the taxed commodity has as a counterpart a fall in the relative price of all other commodities. The gain is calculated in column (b). The fall in the relative price of all other goods necessary to keep the general price level constant is calculated, and this is multiplied by the expenditures on all other goods by each income group. Because of differences in expenditure patterns for the taxed and untaxed commodities, the gains from the lower relative prices of untaxed commodities do not exactly offset the losses on the taxed commodity for any individual income group—although the offset is exact summing over all income groups. Column (c) shows the net effect of the price changes for the taxed and untaxed commodities. In this case the taxed commodity is consumed relatively heavily by lower income groups, so that the net effect is a

TABLE 1.—*Effects of an Excise Tax on a Single Commodity*¹

	(a) Losses due to change in price of taxed commodity	(b) Gains from decline in relative price of other goods	(c) Net effect of price changes (a) + (b)	(d) Factor income change	(e) Income tax changes due to change in factor incomes	(f) Total effect of tax (c) + (d) + (e)
Persons who pay no income tax	—2.94	2.19	— .75	—3.01	0	—3.76
Income taxpayers by adjusted gross income class						
\$ 0—2,999	— .24	.17	— .07	— .26	.06	— .27
3,000—4,999	—1.26	.99	— .27	—1.13	.32	—1.08
5,000—6,999	—2.07	1.63	— .44	—1.60	.43	—1.61
7,000—9,999	—3.76	3.26	— .50	—2.83	.76	—2.57
10,000—14,999	—7.07	6.72	— .35	—5.24	1.48	—4.11
15,000—19,999	—5.49	5.90	.41	—3.92	1.20	—2.31
20,000—49,999	—7.16	8.50	1.34	—6.95	3.02	—2.59
50,000—99,999	—1.21	1.56	.35	—2.94	1.65	— .94
100,000 or more	— .74	1.03	.29	—4.06	2.43	—1.34
Total	—31.94	31.94	0	—31.94	11.35	—20.59

¹ In \$ billions.

loss for lower income groups and a gain for higher income groups.

Because of the excise tax, there is a \$32 billion reduction in real factor income left in the private sector. Column (d) distributes this loss in income among the income groups. Here the loss is distributed proportionately to factor earnings in each income group. This procedure seems reasonable, but more sophisticated estimates could be used if available. Column (e) applies the marginal income tax rate for each group to the income change to show the reductions in income tax payments. Column (f) then sums the effect of the price, income, and income tax changes to obtain the total effect on each income group of imposing the single-commodity excise tax. Comparing the first and last columns of the table reveals the substantial difference between using the naive approach and the more general framework suggested here.

Table 1 has been calculated assuming no inflationary impact of the excise. This is a reasonable procedure for the purpose at hand. If an estimate of inflation is to be used, the numbers in columns (d), (e), and (f) would need to be calculated in both nominal and real terms. The income tax changes would be estimated in both real and nominal terms according to the same types of formulas given earlier for a universal excise. The necessity of presenting two sets of estimates—one nominal and the other real—would serve the purpose of calling attention to built-in assumptions about inflation and to the real as well as monetary effects on taxpayers.

The Measurement of National Income

The second question posed at the outset was whether an increase in excises would affect the measurement of national income. Simplifying national income accounting somewhat, national income can be calculated from the product side of the accounts. Starting with gross national product (*GNP*), capital consumption allowances (*A*) are subtracted to arrive at net national product (*P*):

$$GNP - A = P. \quad (11)$$

National income (*YN*) is then obtained by subtracting indirect taxes (T_i) from net national product:

$$P - T_i = YN. \quad (12)$$

It can be seen that a substitution of indirect taxes, including excises, for direct taxes will affect measured national income without affecting gross national product. That there should be no effect of a change in the form of taxation on measured welfare seems

reasonable, but while the condition holds for gross national product, it does not hold for national income. The usefulness of the national income concept as a welfare measure is called into question.

National income accurately measures the value of factors of production when their value can be measured by what the owners of those factors accept as payments for provision of the factors before the payment of income tax but after the payment of excise tax. Yet, clearly, if one wishes to value the output of factors at the price received, then that price is net of direct taxes as well as indirect taxes. In fact, if there were to be a net factor payments (*NFP*) equation, it would be:

$$NFP = YN - T_d. \quad (13)$$

However, as a measure of income received, the usefulness of a net factor payments measure would be inadequate. Equation (13) properly measures the purchasing power provided to individuals through their provision of factors, but not their total purchasing power nor all expenditures made in their behalf. The difference comes from analyzing what the Government does with the taxes. The Government may provide goods and services (*G*) or transfers (*Tr*) to the economy. If the Government maintains a balanced budget, then

$$Tr + G = T_i + T_p. \quad (14)$$

From equation (14), it can be seen that while the value of net factor payments may be less by the amount of taxes paid, the income received by citizens in the economy may not be less at all,² since the decrease in real factor payments will be offset by an increase in real Government expenditures or real Government transfers.

In the national income accounts, transfers are added back to national income to arrive at a definition of personal income, (*YP*); i.e.,

$$YP = YN + Tr. \quad (15)$$

Personal income thus comes closer to a measure of income received than does national income, but it still has shortcomings. If product equals consumption (*C*) plus Government expenditure, then rearranging equations (14) and (12) yields:

² If the Government does not balance its budget, then the further effect of changes in Government debt or money supply complicates the analysis, but does not mitigate the point that the income received by citizens need not be less because of the presence of an excise tax.

$$YP = C + G + (Tr - T_i). \quad (16)$$

Since the relationship of transfers to indirect business taxes is not strong, personal income also does not make sense as a measure of income received, and its measurement is affected by a switch from direct to indirect taxes.

In short, the conceptual distinction between indirect business taxes and direct taxes for purposes of national income accounting does not appear useful, particularly since it affects what was supposed to have been the basic measure of economic performance, namely national income. A reason the issue is not of more importance is that gross national product has, over the years, supplanted national income as the most frequently used measure.

To obtain a measure either of performance net of depreciation or of welfare, it would seem best not to allow a deduction of indirect business taxes. The basic measure of performance would be net national product. If a modification in thinking along these lines is not made, then changes in excise taxes—whether at the Federal, State, or local level—will continue to result in arbitrary and misleading changes in the measurement of the nation's economic performance.

Deductibility of Excises

The third question with which this paper is concerned has to do with the effects of allowing excise tax payments as a deduction in filing individual Federal income tax returns.

When a sales tax is paid and the receipts are turned over to the Federal, State, or local taxing authority, the proceeds are not available to pay out to labor and capital claimants. Thus, we have for private firms:

	Receipts taken in from the sales of final products
Less:	Excise tax proceeds turned over to taxing authorities
Equals:	Income available to pay to the factors of production which will be reported as taxable income.

This statement is roughly equivalent to equation (12) in the previous section.

This accounting procedure for excises contrasts with the procedure for income taxes. The reported income for tax purposes paid to the factors of production is gross of any individual income taxes. Income taxes must be paid out of the reported income re-

ardless of the amount withheld from that income for tax purposes. For the Federal Government to arrive at a net factor income available to individuals after all State and local tax expenses have been paid requires subtracting the State and local income taxes paid from the reported income received by the factors of production. Thus,

	Income available to pay to the factors of production, which will be reported as taxable income
Less:	State and local income taxes
Equals:	Net factor income remaining after payment of individual expenses, including taxes at the State and local levels.

Again, this statement is roughly equivalent to equation (13). Since business firms have already deducted excise taxes from income before making income payments to the factors of production, a further individual deduction of such taxes constitutes a double deduction of the excise taxes.

In terms of the simple income accounting system of the previous section, the extra deduction of indirect taxes makes the aggregate tax base equal factor income less indirect taxes ($YN - T_i$) or product less indirect taxes twice ($P - T_i - T_i$).

The same cannot be said of State and local income taxes. These have not been deducted from business receipts before making factor payments. If a goal of the tax system is to attain a symmetry with excise taxes, an individual's State and local income taxes should be allowed as a deduction against Federal taxable income, but excise taxes should not be allowed as a deduction since these have already been deducted as an expense at the business level. The Federal income tax base then becomes ($P - T_i - T_D$), not ($P - T_i - T_i - T_D$).

Assume that the Federal Government does not yet allow any itemized tax deductions. Then contrast a closed community in which \$10 is collected in sales tax with one in which \$10 is collected in income tax. Suppose that in both jurisdictions all taxes are transferred to the citizens through nontaxable transfers and further that \$100 worth of goods and services are purchased from firms by those citizens. In the jurisdiction with the sales tax, purchases of \$100 of goods will result in a sales tax of \$10, leaving \$90 in income to be paid out by firms as wages and profits. In the jurisdiction with the income tax, purchases of \$100 will again result in about \$90 of after-tax income being collected in wages and salaries, as firms withhold \$10 in income tax on those wages

and profits. In this latter case, however, the before-tax income will equal \$100—and that is the amount (not the after-tax income) that is reportable for Federal income tax purposes. In the jurisdiction with the sales tax, only \$90 will be reported as wages and profits, as firms deduct the tax payments from total receipts in calculating their profits.

To the extent that there are spillovers from community to community, or that products and services purchased in one community are supplied from another community, the benefit of an extra deduction would need to be apportioned across communities. Still, there is no doubt that in aggregate the sales tax lessens the total amount of income subject to tax while the income tax does not.

In summary, the current procedure of allowing an individual to deduct an estimate of excise tax payments attributable to his purchases constitutes a deduction over and above that already allowed through the tallying of business receipts and expenses. For this reason, relative to a taxing authority that relies more heavily on income taxes, a non-Federal taxing authority that relies more heavily on excises to finance a given bundle of services will find its citizens favored in terms of lightened Federal income tax loads.

While the disallowance of the deduction of excise taxes at the individual level would achieve neutrality between different forms of taxation at the State and local levels, neutrality would still not be achieved in the choice between private and public provision of goods. If one jurisdiction chooses to provide services such as waste disposal through hiring public employees and paying for them out of its tax receipts, the taxes used to finance the services are deductible as an expense. The citizens of that jurisdiction will then have reduced Federal income tax liabilities. If the jurisdiction discontinues public provision and leaves the providing of services to private firms, it can reduce the taxes that were formerly necessary to pay for the services. Individuals will then have more income from the tax reduction to purchase the services privately. However, the expense of the purchases will not be deductible by individuals on Federal income tax returns because the services are not purchased through taxes. The deduction of State and local taxes thus gives an incentive to provide services publicly rather than privately.

One means of eliminating this bias would be to disallow the deduction of State and local income taxes on individual Federal returns and to disallow the excise tax deduction on both individual

and business returns. A proposal of this kind may not be practical and is unlikely to be considered seriously at this time.

An alternative means of eliminating the bias would be to add back to income the governmental expenditures or transfers that are financed through the tax collections. Theoretically, this is the preferred alternative, since the individual payer of the taxes is not necessarily the beneficiary.

Much confusion over the appropriate tax base for income taxation results from the failure to define specifically what is meant by "income" or the base that is to be taxed. Implicitly, any of the income bases mentioned in the previous section could be used: product, factor payments gross of direct taxes, factor payments net of direct taxes, or personal income. None of these four would allow for the extra deduction of the indirect taxes.

However, it was also argued in the previous section that product is a measure that does not vary when taxes are converted to governmental expenditures and transfers and does not vary when direct taxes are substituted for indirect taxes. Suppose now that an "income" tax base that was analogous at an individual level to "product" on an aggregate level were to be designed. In addition, suppose it was necessary to rely on factor payments as the starting point for calculating the base. Some further rearranging of the equations of the previous section reveals that

$$P = YN + G + Tr - T_d. \quad (17)$$

The value of this type of measure of income can be deduced from the argument often made that the value of transfers and governmental services ideally should be included in income. This implies that the income base to be taxed comes closer to a measure of product than of factor payments.

Equation (17) also shows the logic of allowing a deduction of direct taxes from the income tax base and treating separately the question of how or whether governmental expenditures and transfers might be counted in taxable income. State and local provision of goods is still favored to the extent that it is not counted in individuals' incomes, but this is justifiable—at least in some cases—by the administrative impossibility of measuring the amount of services received by each individual. In any case, the equation clearly demonstrates that it is not necessary to allow a deduction of indirect taxes in order to obtain a measure of the income of the individual.

In conclusion, to achieve neutrality among taxes, *either* excises as well as State and local income taxes should be allowed once and

only once as a deduction from the income stream, or none of the taxes should be allowed as a deduction. The once-and-only-once approach—which would be achieved by disallowing an individual excise tax deduction—appears the more practical. Either approach is superior in terms of neutrality to the present asymmetric treatment of the taxes.

Conclusion

This paper has attempted to develop a unified approach to the analysis of excises as they relate to a Federal system which both measures and taxes income. In addition to helping answer the three specific questions considered here, this framework should be useful as future issues related to excises arise.

COMMENT

Gerard M. Brannon, Georgetown University

In the public finance literature there is an uneasy truce over the argument that an excise tax must be passed backward into lower factor prices, an argument that goes back to Harry G. Brown (1939) and Earl Rolph (1952). Assuming that both M and V are unchanged by the tax, there could be no general increase in average prices but the *average* price must increase if excise taxes are to be shifted forward. With the market value of GNP fixed, factor incomes must fall by the amount of the excise-tax increase.

Many economists have held that under most circumstances it is proper to assume that the monetary authorities expect the tax to be shifted forward and therefore to provide the necessary increase in M . This can lead to a considerable methodological debate about the appropriate assumptions for tax shifting analysis (Buchanan, 1960).

Tolley and Steuerle chew over this old bone in the context of several specific tax analysis issues in which the question of excise-tax shifting lurks in the background.

The first specific deals with several matters of revenue forecasting. To start with, the authors make the point that even if one assumes forward shifting, the real value of income tax collections is reduced. I do not know if any of the "forward shifters" have made this point, but I cannot imagine anyone disagreeing with it.

Another technical point about revenue estimating made by the authors is that if there is no price increase, real income tax collections fall by the marginal income tax rate times the excise-tax increase. With full forward shifting, real income tax collections fall only by the average tax rate times the excise tax increase. The difference in the two cases is that forward shifting amounts to general inflation, and income taxes rise due to inflation.

After these formalities the authors finally get around to the substantive issue: What assumption should revenue estimators make about forward shifting (i.e., about whether inflation will be allowed to accommodate forward shifting)? Clearly Tolley and Steuerle are right that asserting downward inflexibility of money wages does not settle the matter because backward shifting could be accomplished by reducing increases in money wages. After some

vague argumentation, well sprinkled with "may's" and "likely's," they conclude in favor of backward shifting, especially for a non-general excise tax, such as one on oil and gas.

I do not find the argument very convincing. Their "strong" point seems to be an assertion that the monetary authorities, not knowing precisely how much to ease credit to provide full accommodations, will ease credit by a *lesser* amount. Why a lesser amount is not clear.

As applied to the potential issue of an energy tax, that tax must be viewed as a substitute for adapting U.S. energy prices to the current price of imported oil. There is some serious literature (Gordon, 1975; Phelps, 1977) on the consequences of alternative monetary accommodation policies with regard to energy prices that seem appropriate to an energy tax. The practical advice to Treasury revenue estimators is to make every effort to obtain the appropriate price assumption from the Council of Economic Advisors or from the Federal Reserve. Having decided on the assumption, the authors' argument is correct that the aggregate implications of any assumed inflation should be taken into account.

The last revenue estimating point Tolley and Steuerle deal with is back in the noncontroversial area: the burden distribution of an excise-tax increase by income classes looks rather different in the backward- and forward-shifting cases. In an illustrative calculation it is shown that the total effect of a backward-shifted energy tax is more regressive than that of a forward-shifted one since the lower factor incomes in high-income brackets are modified by lower income taxes. (The data sources for the table are not given and some entries look suspicious; persons who pay no income taxes have a higher share of factor incomes than they have of consumption expenditures!)

The next specific analytic issue the authors address is the usefulness of the statistical series "national income." There can be little disagreement with the conclusion that national income, which subtracts excise taxes, but not income taxes, from GNP is quite useless.

The third specific analytic issue is the deductibility of State and local general sales taxes for purposes of the Federal income tax. On the basis of their preference for assuming backward shifting, Tolley and Steuerle conclude that sales taxes have already been excluded from factor incomes and that a specific deduction for estimated taxes "paid" is improper. Since factor incomes are reported before State and local income taxes, the deduction of income taxes is acceptable.

A number of arguments about the deductibility of State and local taxes can be raised. I limit myself here to addressing the specific point argued by Tolley and Steuerle that present law allows a "double" deduction and exclusion of sales taxes. Some simple examples of pairs of States with equal real incomes will throw some doubt on the conclusion.

The pair of States A and B have no interstate trade, so price levels are completely independent. Therefore, I assume backward shifting of B's sales tax. A has no sales tax but raises equal revenue by income tax.

The pair of States C and D obtain goods from the same suppliers, so prices before tax are the same. D has a sales tax and C, an equal income tax. It follows that market prices in D will be higher by the amount of the Sales tax. We also consider the pair of States C' and D', which are like C and D except that they are under a stern monetary authority that insists on backward shifting of the *average* sales tax. The state-aggregate economic accounts are as follows:

	A	B	C	D	C'	D'
Net national product	100	100	100	110	95	105
State sales tax	0	10	0	10	0	10
"National" income	100	90	100	100	95	95
State income tax	10	0	10	0	10	0
Taxable income without sales tax deduction	90	90	90	100	85	95
Taxable income with sales tax deduction	90	80	90	90	85	85

The case the authors describe is pair AB. Under these circumstances, factor income in B is already reduced by a backward-shifted sales tax; allowing a Federal tax deduction for State sales taxes in this pair would produce a lower tax in B even though taxpayers in A and B have the same real income.

In the CD case, articles in D sell at the same manufacturers' list price as in C but the local sales tax is added to the price. Here deduction of the sales tax is called for to produce the same Federal taxable income for taxpayers with the same real income. The CD case is not changed in substance if we assume that when D imposed its sales tax there was no increase in average prices and thus a fall in prices before tax and in factor incomes (C'D').

I conclude that the problem Tolley and Steuerle set for themselves cannot be solved by this general theorizing about forward

or backward shifting. What is involved is an empirical question about differences in total prices of taxed goods between sales-tax and no-sales-tax States (or between high- and low-rate-sales-tax States). Without having done this research I suggest that the conventional wisdom is that, *ceteris paribus*, prices differ by the sales tax.

References

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